Claims

1. A method of regulating apoptosis in a cell, said method comprising targeting an abnormally or alternatively spliced mRNA, an abnormally or alternatively structured mRNA, or a product of either.

2. A method according to claim 1 further comprising targeting the junctions of the mRNA molecule that is abnormally spliced or abnormally structured.

3. A method according to claim 1 further comprising targeting a protein product following translation of the abnormally spliced or abnormally structured mRNA.

4. A method according to any of claims 1 to 3 further comprising the selective silencing of abnormal splice variants of the Bcl-2 gene.

5. A method according to claim 4 further comprising the targeting of any of the abnormal splice variants selected from the group consisting of: Bcl-2α-591, Bcl-2α-588, Bcl-2α-480, Bcl-2α-633, Bcl-2β-489, Bcl-2β-474, Bcl-2β-420 and/or Bcl-2β-315.

6. A method according to claim 5 further comprising targeting of the mRNA sequence flanking the splice junction between nucleotides 111 and 241 of Bcl-2α-591.

7. A method according to any of the preceding claims further comprising targeting an abnormally spliced mRNA or a product thereof, by introducing into a cell containing a gene which is abnormally spliced and which is to be targeted, an RNA construct having a nucleotide sequence which is homologous to mRNA within said cell wherein said mRNA includes genetic information of the gene element that is abnormally spliced.

8. A method according to claim 7 wherein the RNA construct is a small interfering dsRNA (siRNA).

9. A method according to claim 8 wherein the siRNA is up to 28 nucleotides long.

10. A method according to any of claims 1 to 6, further comprising targeting an abnormally spliced mRNA or a product thereof, by introducing into a cell containing a gene which is abnormally spliced and which is to be targeted, an agent selected from the group consisting of: small molecule or protein; polypeptide; peptide; aptamer; chemical; antibody; nucleic acid; polypeptide or nucleotide probe; anti-sense RNA; shRNA; miRNA; and Bcl-2 derived products including abnormal Bcl-2 splice variants which inhibit Bcl-2 either directly or indirectly, which agent interacts with or binds with the abnormally spliced mRNA or protein expressed by the abnormally spliced mRNA.

11. A nucleotide construct with a nucleotide sequence which is homologous to mRNA transcribed from an abnormally spliced gene.

12. A nucleotide construct according to claim 11 wherein said construct comprises dsRNA.

13. A nucleotide construct according to claim 12 wherein the construct is 20 to 28 nucleotides long.

14. A nucleotide construct according to claim 13 wherein the RNA construct is 21 to 22 nucleotides long.

15. A nucleotide construct such as siRNA, anti-sense RNA, shRNA or miRNA as means for silencing the expression of an abnormally spliced gene for use as a medicament.

16. An agent selected from the group consisting of: small molecule or protein; polypeptide; peptide; aptamer; chemical; antibody; nucleic acid; polypeptide or nucleotide probe, which agent interacts with or binds with a protein expressed by an abnormally spliced mRNA for use as a medicament.

17. A nucleotide construct such as siRNA, anti-sense RNA, shRNA or miRNA for the manufacture of a medicament for the treatment of cancerous cell growth.

18. An agent selected from the group consisting of: small molecule or protein; polypeptide; peptide; aptamer; chemical; antibody; nucleic acid; polypeptide or nucleotide probe which agent interacts with or binds with a protein expressed by an abnormally spliced mRNA for the manufacture of a medicament for the treatment of cancerous cell growth.

19. A pharmaceutical composition comprising a nucleotide construct such as siRNA, anti-sense RNA, shRNA or miRNA and a pharmaceutically acceptable diluent or carrier.

20. A pharmaceutical composition comprising an agent selected from the group consisting of: small molecule or protein; polypeptide; peptide; aptamer; chemical; antibody; nucleic acid; polypeptide or nucleotide probe which agent interacts with or binds with a protein expressed by an abnormally spliced mRNA and a pharmaceutically acceptable diluent or carrier.

21. Use of a DNA or RNA expression vector as a delivery means for a molecule which is used in the targeting of an abnormally spliced mRNA or a product thereof.

22. A DNA or RNA expression vector comprising an expression cassette including the nucleotide sequence selected from the group consisting of;

a) the nucleic acid sequence of the abnormally spliced gene element as shown in Fig 1;

b) a nucleic acid molecule which hybridizes to the nucleic acid sequence of (a) ;

c) a nucleic acid molecule which has a nucleic acid sequence which is degenerate because of the genetic code to the sequences in a) and b) and any sequence which is complimentary to any of the above sequences;

wherein the expression cassette is transcriptionally linked to a promoter sequence.